

61. (Twice Amended) The device as set forth in claim 19, wherein bores (14") [or similar openings are produced, including] through-holes and/or blind holes [in] for automotive engines are produced.

62. (Twice Amended) The device as set forth in claim 37, wherein elongated sections ([12,]12') of solid metal [are produced, especially where hardened and/or coated,] including at least one flat surface (14') [including rods and strip and/or tubular material, including] are produced for headrest brackets in automobiles.

REMARKS

Claims 1-20 and 22-60 remain active. Undersigned counsel thanks Examiner Echols for telephonic discussion of the case. The claims have been clarified in response to the rejections under 35 U.S.C. § 112, first and second paragraphs, and should now be in a form suitable for searching the prior art.

A first embodiment of the invention is concerned with a method and device for surface treatment of workpieces 12 in the form elongated sections having a round surface 14, for example, having a round cross-section in the form of round or tubular materials (see Figs. 2 to 7B).

A second embodiment of the invention is concerned with a method and device for surface treatment of workpieces 12" having at least one bore 14" or similar opening, such as a through-hole and/or a blind hole (see Figs. 8A, 8B).

The difference between the first and the second embodiments is that the surface of workpiece 12 is the outer surface of the elongated sections, while the surface of workpiece 12" is the inner surface.

In both, the first and the second embodiments, the surface treatment is worked by at least one roll 16, 16', 16"" provided with an outer profile 22, 22' having the form of annular beads and recesses at an angle α or α' to the longitudinal centerline of the roll. In this context, in theory it would be possible to treat workpiece 12, 12" by only one roll 16 or 16' or 16""; in practice preferably by two rolls, 16 and 16' or 16"". Since the treatment of workpieces 12, 12" would be sufficient using two rolls 16, 16', 16"", it would also be possible to perform treatment of workpiece 12, 12" by three rolls.

To the contrary, a third embodiment of the invention is concerned with a method and device for surface treatment of workpieces 12' of elongated sections, including at least one flat surface 14'; for example, a workpiece having a square, rectangular or other polygonal cross-section (see Figs. 9A to 12B).

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Because of the form of the workpieces 12', surface treatments based on the method or device according to the first and second embodiments of the invention are excluded.

As a consequence, in the third embodiment the arrangement of the rolls on the one hand, and the configuration of annular beads and recesses on the other hand, differ from those of the first and second embodiments. The first difference is that the roll is arranged substantially perpendicular or at an angle β to the longitudinal direction (arrow 28) of the workpiece 12' (see claim 38). The second difference is in the outer profile 76, 76' or 78, 78' of the roll (see in particular Figs. 10A, 11, 12A, 12B).

Meanwhile, the annular beads 94 and recesses 96 of roll 74' are arranged perpendicularly to the longitudinal centerline 80 thereof (see claim 42). Such a configuration, however, does not fall within the scope of protection based on the wording "at an angle α or α' to the longitudinal centerline of the roll". In this embodiment, roll 74' (see Figs. 10A, left) is followed by an additional roll 74' (see Fig. 10A, right) to work said surface of the said workpiece 12' in sequence in the opposite direction, i.e., the annular beads 74 and recesses 76 of both rolls 74' are out-of-line to each other. In other words, in regions of the first (left) roll 74' having beads 94, are recesses 96 on the second following (right) roll 74'; meanwhile the regions of the first (left) roll 74', having recesses 96, are directed to regions having beads 94 on the second following (right) roll 74'.

Besides, the surface treatment of said workpieces 12' may be worked out alternatively or accumulatively by at least one roll having the form of annular beads 94 and recesses 96, which are arranged at an angle α , α' to the longitudinal centerline 80 thereof (see claim 40) and/or which are arranged perpendicularly to the longitudinal centerline 80 thereof (see claim 41).

CONCLUSION

Applicants submit respectfully that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action, and an early Notice of Allowance are requested.

Applicants's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 625-3500. All correspondence should be directed to our address given below.

AUTHORIZATION

Applicants believe there is no fee due in connection with this filing. However, to the extent required, the Commissioner is hereby authorized to charge any fees due in connection with this filing to Deposit Account 50-1710 or credit any overpayment to same.

Respectfully submitted,



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